**AMENDMENTS TO THE CLAIMS:**

The listing of claims shown below will replace all prior versions, and listings, of claims in the Application:

1. (Previously Presented) A method of forming $MgB_2$ films *in-situ* on a substrate comprising the steps:

(a) depositing boron onto a surface of the substrate in a depressurized deposition zone;

(b) moving the substrate into a reaction zone containing pressurized gaseous magnesium, the reaction zone being physically separate from the depressurized deposition zone and containing negligible amounts of oxygen;

(c) moving the substrate back into the deposition zone; and

(d) repeating steps (a)-(c).

2. (Original) The method of claim 1, wherein the movement of steps (b) and (c) is produced by rotating the substrate on a platen.

3. (Original) The method of claim 2, wherein the platen is rotated at a rate within the range of about 100 rpm to about 500 rpm.

4. (Original) The method of claim 1, wherein the substrate is heated to a temperature within the range of about 300°C to about 700°C.

5. (Original) The method according to claim 1, wherein the substrate is selected from the group consisting of LSAT, $LaAlO_3$, MgO, $SrTiO_3$, r-plane sapphire, c-plane sapphire, m-plane sapphire, yttria-stabilized zirconia (YSZ), silicon carbide, polycrystalline alumina, silicon, and stainless steel.

6. (Previously Presented) The method of claim 1, wherein the reaction zone contains gaseous magnesium at a partial pressure of about 10 mTorr.

7. (Original) The method according to claim 1, wherein the reaction zone is coupled to a heated source of magnesium.

8. (Original) The method according to claim 1, wherein the substrate is a wafer.

9. (Original) The method according to claim 1, wherein the substrate is a tape.

10. (Original) The method according to claim 1, wherein the method is used to form $MgB_2$ on a plurality of substrates.

11. (Previously Presented) The method of claim 1, wherein the boron is evaporated at a pressure of less than $10^{-6}$ Torr in the deposition zone.

12. (Original) The method of claim 1, wherein the $MgB_2$ film is formed on a single side of the substrate.

13. (Previously Presented) A method of forming $MgB_2$ films *in-situ* on a substrate comprising the steps:

(a) depositing boron onto a surface of the substrate in a deposition zone;

(b) moving the substrate into a reaction zone containing pressurized gaseous magnesium;

(c) moving the substrate back into the deposition zone; and

(d) repeating steps (a)-(c);

wherein the $MgB_2$ film is formed on two sides of the substrate.

14. (Previously Presented) A method of forming a film of $MgB_2$ *in-situ* comprising the steps of:

providing a rotatable platen, the platen being rotatable within a housing having a pressurized reaction zone operatively coupled to an evaporation cell and a physically separate depressurized deposition zone, the pressurized reaction zone containing negligible amounts of oxygen;

providing magnesium in the evaporation cell;

providing a source of boron disposed adjacent to the depressurized deposition zone;

providing an electron beam gun aimed at the source of boron;

loading a substrate onto the platen;

rotating the platen;

heating the local environment around the substrate;

heating the evaporation cell so as to produce pressurized gaseous magnesium in the reaction zone; and

evaporating the boron with the electron beam gun.

15. (Original) The method according to claim 14, wherein the local environment around the substrate is heated to a temperature within the range of about 300°C to about 700°C.

16. (Original) The method according to claim 14, wherein the evaporation cell is heated to a temperature of at least 550°C.

17. (Original) The method according to claim 14, wherein the platen is rotated at a rate within the range of about 100 rpm to about 500 rpm.

18. (Original) The method according to claim 14, wherein the substrate is selected from the group consisting of LSAT, $LaAlO_3$, MgO, $SrTiO_3$, r-plane sapphire, c-plane sapphire, m-plane sapphire, yttria-stabilized zirconia (YSZ), silicon carbide, polycrystalline alumina, silicon, and stainless steel.

19. (Original) The method of claim 14, wherein the substrate is a wafer.

20. (Original) The method of claim 14, wherein the substrate is a tape.

21. (Original) The method of claim 14, wherein the step of loading the platen comprises loading the platen with a plurality of substrates.

22. (Previously Presented) The method of claim 14, wherein the boron is evaporated at a pressure of less than $10^{-6}$ Torr in the deposition zone.

23. (Original) The method of claim 14, wherein a film of $MgB_2$ is formed on a single side of the substrate.

24. (Previously Presented) A method of forming a film of $MgB_2$ *in-situ* comprising the steps of:

providing a rotatable platen, the platen being rotatable within a housing having a reaction zone and a separate deposition zone;

providing an evaporation cell operatively coupled to the reaction zone, the evaporation cell containing magnesium;

providing a source of boron disposed adjacent to the deposition zone;

providing an electron beam gun aimed at the source of boron;

loading a substrate onto the platen;

rotating the platen;

heating the local environment around the substrate;

heating the evaporation cell so as to produce gaseous magnesium in the reaction zone;

evaporating the boron with the electron beam gun;

removing the substrate from the platen;

turning the substrate over;

loading the substrate onto the platen;

rotating the platen;

heating the local environment around the substrate;

heating the evaporation cell so as to produce pressurized gaseous magnesium in the reaction zone; and

evaporating the boron with the electron beam gun.

25. (Previously Presented) The method of claim 14, wherein the reaction zone contains gaseous magnesium at a partial pressure of about 10 mTorr.

26. (Currently Amended) A method of forming a thin film of ~~a known compound~~ magnesium diboride *in-situ* on a substrate comprising:

(a) depositing ~~one or more elements of the compound~~ boron onto a surface of the substrate in a depressurized deposition zone;

(b) heating ~~a metallic element of the compound~~ magnesium so as to produce a pressurized gaseous phase of magnesium ~~the metallic element~~ inside a reaction zone, the reaction zone being physically separate from the depressurized deposition zone and containing negligible amounts of oxygen;

(c) moving the substrate into the reaction zone containing the pressurized magnesium ~~metallic element~~;

(d) moving the substrate back into the depressurized deposition zone; and

(e) repeating steps (a)-(d).

27.-32. (Cancelled)